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Identifying Basic English Language Proficiency for Air Traffic Controllers

ABSTRACT

A lack of proficiency in the English language among international Air Traffic Controllers and Pilots is considered a major aviation safety issue. Although there are several training and research initiatives addressing aviation phraseology and terminology, there has been little research conducted to address or define a basic proficiency level of English required for air traffic control.

In response to this pressing need, in 1997, the International Civil Aviation Organization (ICAO) approved a task entitled "Radiotelephony speech for international aviation" which requests the development of minimum skill level requirements in the use of the English language. Additionally, Congress developed House Report language for the FY 1998 Appropriations Act that set aside monies in the FAA Research, Engineering and Development (R,E &D) budget for " …additional research into assessment, evaluation and development of training methodologies related to the English language proficiency problem."

A research project, sponsored by the Office of International Aviation and the Office of Air Traffic Operations, is being conducted by the Office of the Chief Scientific and Technical Advisor for Human Factors to determine the minimally acceptable level of English required to control air traffic. In addition, evaluations of current proficiency in English language usage among Air Traffic controllers in selected facilities in Latin America have been conducted. The data from the research activities will provide the basis for an international Air Traffic standard for English language proficiency and future training curriculum.

Methodology

Language performance tasks that required English language proficiency to control air traffic were identified from FAA's Separation and Control Hiring (SACHA) Final Job Analysis. These performance tasks were used to develop the initial ATCELP job analysis questionnaire consisting of 173 items. The job analysis instrument was administered to 103 FAA air traffic controllers in the United States who rated each task in terms of frequency and importance. The job analysis questionnaire was then translated into Spanish and administered to 69 Latin American international air traffic controllers. The final job analysis questionnaire,

after additional revisions were made by Latin American ATC managers, consisted of 146 language task items. American and Latin American ATC responses on frequency and importance to the job analysis questionnaire were compared on the 146 communication performance tasks.

The 146 Job analysis performance tasks were then rated by ATC experts trained in the Defense Language Institute methodology to assign levels of performance difficulty on the ILR proficiency scale.

In addition, 18 air traffic professionals, ATC's and pilots, assisted by trained language specialists from the Defense Language Institute's English Language Center, provided independent and consensus ratings of English listening and speaking competence for 60 international air traffic controllers. The ratings, using Interagency Language Roundtable (ILR) Scale, were based on evaluation of Oral Proficiency Interviews and real time recorded air traffic controller-pilot sessions.

Analyses

Performance tasks were judged for frequency, importance, and criticality and were graded independently and by consensus with regard to placement on the ILR listening and speaking performance scales. Overall minimum proficiency levels were identified for listening comprehension and speaking ability. Ratings of individual air traffic controller listening and speaking proficiency were correlated with professional judgments of communication competence to perform the duties of air traffic control.

Results

Estimates of interrater reliability were uniformly high for performance task analyses, oral proficiency interview tapes, and radio performance competence judgments. Regression analyses provided estimates of levels of ILR-scaled listening and speaking proficiency associated with professional judgments of linguistic competence to carry out air traffic controller duties.

Conclusions

Several interesting and encouraging findings emerged from this initial research. American and Latin American ATC's provided similar importance ratings on job analysis task items. This suggests that the ATC English language proficiency levels are common across two international air traffic control environments.

The preliminary analyses of the various data sources identified the Overall Proficiency Level (2,1+) as a requirement for performing the ATC language tasks. On the DLI scale, a 2 in listening proficiency indicates that a person "Can understand speech in a standard dialect delivered at a normal rate with some repetition and rewording, by a native speaker not used to dealing with foreigners; narration about current, past and future events; can follow essential points of discussion at an elementary level on topics in his/her professional field."

A 1+ in Speaking Ability on the DLI scale suggests that a person's "ability may extend beyond immediate survival needs; can handle limited routine work-related interactions such as more complex flight clearances and simple non-routine events related to specialty."

Further research is underway, including running additional DLI ratings and obtaining construct validity evidence. Our final report will expand on these findings.